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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/761,778	01/18/2001	Yoshinobu Kubota	1460.1016	5961
21171	7590	02/19/2004	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			KAO, CHIH CHENG G	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 02/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/761,778

**Applicant(s)**

KUBOTA ET AL.

**Examiner**

Chih-Cheng Glen Kao

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 15 and 16 are objected to because of the following informalities, which appear to be minor grammatical or lack of antecedent basis problems: (claim 15, line 3, “formed the substrate”) and (claim 16, lines 4, “the optical coupler”).

The following respective suggestions may obviate the objections: (claim 15, line 3, inserting - -on- - after “formed”) and (claim 16, line 4, inserting - -with an optical coupler- - after “guiding light in line 2 of claim 16).

For purposes of examination, the claims have been treated as such. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 6 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for applying a clock signal voltage at a predetermined cycle to a first electrode for varying a refractive index of a first optical element, does not reasonably provide enablement for varying a refractive index of a third optical element. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

For purposes of examination, the claim will be treated as varying a refractive index of a first optical element.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 9-12, 15, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by

Sano et al. (US Patent 4756587).

4. With regards to claim 1, Sano et al. discloses a device comprising a first optical element (Fig. 6(a), #1) on a substrate (Fig. 6(b), #13)) having an optical coupling part (Fig. 6(a), #3), a second optical element (Fig. 6(a), #27) on the substrate guiding light from the optical coupling part of the first optical element, and a third optical element (Fig. 6(a), #5) on the substrate guiding or protecting light radiated from the optical coupling part.

5. With regards to claims 9 and 10, Sano et al. discloses a device comprising a substrate (Fig. 10, #13) having at least two optical elements (Fig. 10, #44, 35, and 36), a first optical waveguide (Fig. 10, #1) connecting the optical elements, and a pair of second optical waveguides (Fig. 10, #4 and 5) formed on both sides of the first optical waveguide to guide light radiated or leaking from the first optical waveguide.

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6. With regards to claims 11 and 12, Sano et al. further discloses the third optical element guiding light to an outside of the substrate (Fig. 6(b), #5), which extends to an outside face of the substrate, to at least one of an upper and lower surface, and releases the light to an exterior at the surface to which the optical element extends (Fig. 6(b), #5).

7. With regards to claims 15 and 16, Sano et al. discloses an apparatus and method comprising a substrate (Fig. 6(b), #13), an optical coupler (Fig. 6(a), #3) formed on the substrate and guiding light from an optical component (Fig. 6(a), #1) on the substrate to another optical component (Fig. 6(a), #27) on the substrate, and an optical element (Fig. 6(a), #5) on the substrate guiding light which is radiated or leaking from the optical coupler to an outside of the substrate (Fig. 6(b), #5).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (US Patent 5117470) in view of Sano et al.

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9. With regards to claim 1, Inoue et al. discloses a device comprising: a first optical element (Fig. 32, #61) on a substrate (Fig. 32, #9) having an optical coupling part (Fig. 32, #65a) and a second optical element (Fig. 32, #68a) on the substrate guiding light from the first optical element.

However, Inoue et al. does not disclose a third optical element on the substrate guiding light radiated from the optical coupling part.

Sano et al. teaches a third optical element (Fig. 11, #5) waveguide on the substrate guiding light radiated from the optical coupling part.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the device Inoue et al. with the third optical element of Sano et al., since one would be motivated to incorporate it to create low loss and have a favorable wavelength-separation characteristic as implied from Sano et al. (col. 1, lines 55-58).

10. With regards to claim 2, Inoue et al. further discloses at least one optical element as a Mach-Zehnder type optical element (Fig. 32, #70a).

11. With regards to claim 3, Inoue et al. further discloses at least one optical element as a Mach-Zehnder interferometer type optical modulator (Fig. 32, #70a).

12. With regards to claim 4, Inoue et al. further discloses at least two optical elements are connected in tandem (Fig. 32, #70a and 70c).

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13. With regards to claim 8, Inoue et al. further discloses light from the first optical element is formed in a Mach-Zehnder interferometer structure to attenuate light intensity and vary an amount of attenuation (Fig. 32, #70c).

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. in view of Sano et al. as applied to claim 1 above, and further in view of Asano et al. (US Patent 5621839).

Inoue et al. in view of Sano et al. suggests a device as recited above.

However, Inoue et al. does not disclose a ferroelectric substrate.

Asano et al. teaches a ferroelectric substrate (Title).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the device of Inoue et al. in view of Sano et al. with the ferroelectric substrate of Asano et al., since one would be motivated to build a device in which a light dividing ratio and a light insertion loss are not varied as shown by Asano et al. (col. 2, lines 9-16).

15. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. in view of Sano et al. as applied to claim 1 above, and further in view of Ooi et al. (US Patent 5917628).

For purposes of being concise, Inoue et al. in view of Sano et al. suggests a device as recited above.

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However, Inoue et al. does not disclose a clock signal voltage to an electrode for varying a refractive index of a first optical waveguide and a signal voltage modulated to a second electrode.

Ooi et al. teaches a clock signal voltage to an electrode (Fig. 1, #62 and 70) for varying a refractive index of a first optical waveguide (inherent) and a signal voltage modulated to a second electrode (Fig. 1, #63 and 70).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the device of Inoue et al. in view of Sano et al. with the clock and modulated signals of Ooi et al., since one would be motivated to build this configuration to make a conventional optical time-division multiplexer (col. 5, lines 35-68) as implied from Ooi et al.

16. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. in view of Sano et al. as applied to claim 1 above, and further in view of Hosoi (US Patent 5475771).

Inoue et al. in view of Sano et al. suggests a device as recited above:

However, Inoue et al. does not disclose a lithium niobate substrate.

Hosoi teaches a lithium niobate substrate (col. 1, lines 11-15).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the device of Inoue et al. in view of Sano et al. with the substrate of Hosoi, since one would be motivated to create a large electromechanical coupling coefficient when building a device as shown by Hosoi (col. 1, lines 11-15).



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17. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. as applied to claim 12 above, and further in view of Jestel et al. (US Patent 5396328).

Inoue et al. discloses a device as recited above.

However, Inoue et al. does not disclose mirrors or diffraction grating at the end.

Jestel et al. teaches mirrors (Fig. 1, #15-17) or diffraction grating (col. 7, lines 4-12, and Fig. 6, #55) at the end.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the device of Inoue et al. with the mirrors or diffraction gratings of Jestel et al., since one would be motivated to incorporate them for guiding light to a different location as implied from Jestel et al. (col. 1, lines 10-20).

#### ***Response to Arguments***

18. The objections to the claims have been withdrawn in light of the Amendment made of record on 10/23/03.

19. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

With regards to Inoue et al., the reference still applies since it relates to a guided-wave optical circuit. Asano et al. still applies with regards to its teaching of a substrate made of ferroelectric crystals. Ooi et al. still applies with regards to its teaching of a clock signal. Hosoi et al. still applies with regards to its teaching of a lithium niobate substrate.

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*Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



gk



DAVID V. BRUCE  
PRIMARY EXAMINER